



Uterine Lipoleiomyoma: A Five Year Clinicopathological Study

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ABSTRACT

Aim: Uterine fatty tumors are rare benign neoplasms. Amongst them, uterine lipoleiomyoma is considered as a rare variant of uterine leiomyoma, constituting less than 0.2% of benign uterine tumors. Our study was aimed to investigate the spectrum of clinical and pathological features of uterine lipoleiomyoma with emphasis on its presumptive histogenesis and the possible origin of this tumor.

Material and Methods: This study was carried out in the Department of Pathology and Department of Obstetrics & Gynaecology, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India for a period of 5 years (January 2011 - December 2015). We retrospectively analyzed 589 women, who had undergone surgery for uterine leiomyomas or any gynaecological malignancies. The data obtained consisted of patient's age, clinical presentation, radiological features, histopathology and immunohistochemistry (IHC) findings. The data collected was analyzed by descriptive statistics.

Results: A total of 728 uterine leiomyoma and 10 lipoleiomyoma cases were seen. The patients age for lipoleiomyoma ranged from 30 to 75 years. Six cases were postmenopausal, three premenopausal and one reproductive age group woman. Two patients were diabetic, two had hypothyroidism while one had high triglyceride levels. On radiology, three cases were detected as uterine leiomyomas and in two cases a definite diagnosis of lipoleiomyoma could be established. Five patients had been operated for symptomatic leiomyomas (pelvic pain, menstrual disturbances) and rest five patients for gynaecological malignancies (cervical malignancy, endometrial carcinoma (2), ovarian teratoma, ovarian serous carcinoma). Its size ranged from 1 to 15 cm in diameter. Nine tumors were in the uterine corpus and one was in the cervix. No tumor displayed atypia, mitosis, necrosis, calcification, degenerative changes or prominent blood vessels. On IHC, the smooth muscle cells, pericytes, endothelial cells were positive for smooth muscle actin (SMA), desmin, vimentin while the adipocytes were positive for vimentin and were negative for estrogen receptor (ER), progesterone receptor (PR), Ki-67. There were no recurrences or tumor-related fatalities in follow up period of 6 months to 4 years.

Conclusion: Uterine lipoleiomyoma is a benign fatty tumor with favourable outcome and complex histogenesis.

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Introduction

Uterine lipoleiomyoma is a rare and usually an incidental benign fatty tumor, which is considered to be a variant of uterine leiomyoma. This tumor is similar to myolipoma of the soft tissue and is composed of benign smooth muscle and mature adipose tissue.^[1] It usually occurs in peri and postmenopausal women, but can also occur in premenopausal women.^[2] Many of these patients are asymptomatic, though some have symptoms similar to uterine leiomyoma.^[3] The origin of this tumor is still debatable. Earlier this tumor was considered to be a hamartoma, choristoma, connective tissue degeneration, fatty metamorphosis but now it is regarded as a distinctive true neoplasm.^[4] Therefore, its pathogenesis needs to be elucidated.

The aim of the present study was to investigate the spectrum of clinical and pathological features of uterine lipoleiomyoma with emphasis on its presumptive histogenesis and the possible origin of this tumor.

Material & Methods

This was a retrospective study carried out in the Department of Pathology and Department of Obstetrics & Gynaecology, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India over a period of 5 years (January 2011 - December 2015). 589 women who had undergone surgery for uterine leiomyomas or any gynaecological malignancies were included in the study. 728 uterine leiomyomas and 10 lipoleiomyomas were seen. For the purpose of analysis, information was obtained from patient medical and histopathology records. The data that was gathered consisted of patient's age, clinical presentation, radiological features, histopathology and immunohistochemical findings. Descriptive statistics were used for the data collected.

Results

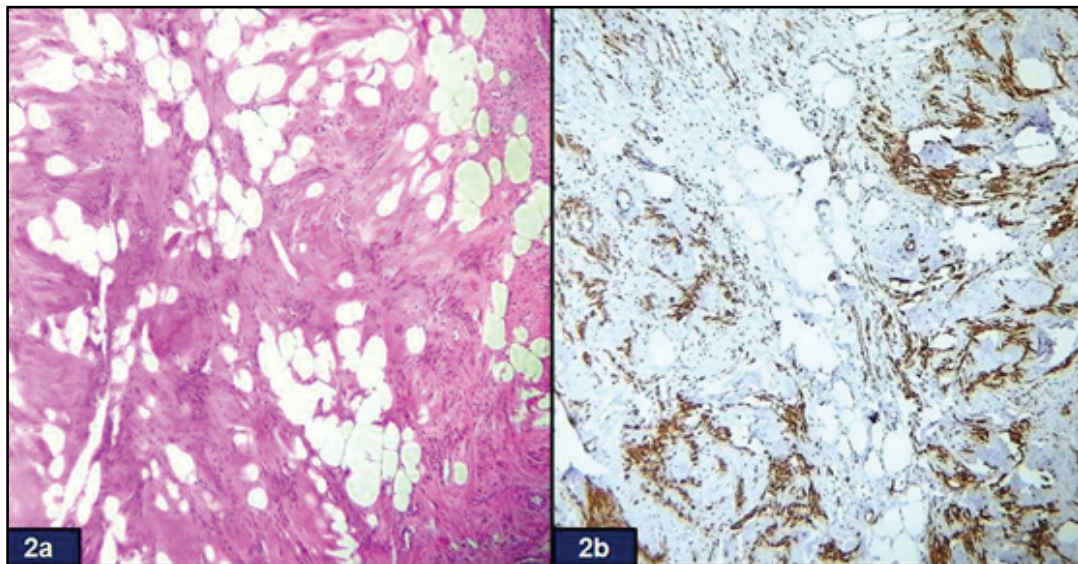
There were 10 patients diagnosed with lipoleiomyoma during the study period of 5 years, representing 1.3 % of all uterine leiomyomas. The patients age ranged from 30 to 75 years. Six cases were postmenopausal, three premenopausal and one reproductive age group woman. Two patients were diabetic, two had hypothyroidism while one had high triglyceride levels. On radiology, three cases were detected as uterine leiomyomas and in two cases a definite diagnosis of lipoleiomyoma could be established.

Five patients were operated for symptomatic leiomyomas (pelvic pain, menstrual disturbances etc.) and rest five patients for gynaecological malignancies (cervical malignancy, endometrial carcinoma (2), ovarian teratoma, ovarian serous carcinoma). Grossly, nine tumors were located at the uterine corpus, intramurally and one was in the cervix. Their size ranged from 1 to 15 cm in diameter. Depending upon the amount of fatty component, the cut surface was grayish white (resembling uterine leiomyoma) to yellow in colour. They were lobulated to sharply circumscribed (Figure 1). On histopathology, all the lipoleiomyomas consisted of admixture of smooth muscle cells and mature adipose tissue. The adipose tissue component varied from 5% to 80% of the tumor mass. None displayed cytologic atypia (smooth muscle or adipocytes), necrosis, calcification, any degeneration and prominent blood vessels (Figure 2a)

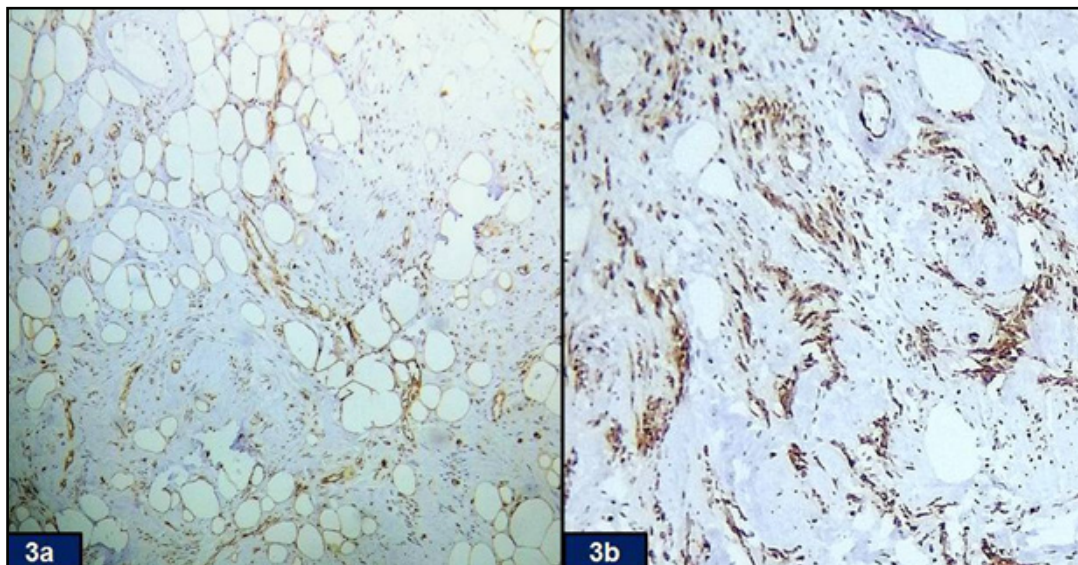
In the cases of gynaecological malignancies, this tumor was usually an incidental finding. There was no gross or microscopic contiguity between the lipoleiomyoma and the malignancy. On IHC, in all the cases the smooth muscle cells, pericytes, endothelial cells were positive for SMA, desmin, vimentin while the adipocytes were positive for vimentin and were negative for ER, PR, Ki-67 (Figure 2b, 3a, 3b). There was no recurrences or tumor related deaths in follow-up period of 6 months to 4 years.



Fig. 1: Cut section of cervix with uterus showing a well - demarcated intramural grayish white to yellow whorled mass.



**Fig. 2: a - Microscopic examination of a lipoleiomyoma comprising of two components, bundles and fascicles of smooth muscle cells admixed with adipose tissue (H&E, x 20).
b - SMA positivity of the smooth muscle cells (IHC, x 20).**



**Fig. 3: a - Adipocytes and smooth muscle cells showing vimentin positivity (IHC, x 20).
b - Desmin positivity of the smooth muscle cells (IHC, x 40).**

Discussion

Lobstein, in 1816, first described lipoleiomyomas, but later on Willen and Pounder^[5, 6] designated these tumors as “uterine fatty tumors” and subdivided them into “lipoma” and “mixed lipomas/leiomyomas” (lipoleiomyomas). In our study, lipoleiomyomas represented 1.3% of all leiomyomas. Its clinical presentation is non-specific, and this tumor generally occurs in asymptomatic obese peri and post

menopausal women. The most common signs and symptoms are similar to typical uterine leiomyomas (menstrual disturbances, abdominal and/or pelvic pain, a palpable mass, urinary frequency, incontinence and a sensation of pressure).^[3,7] Its commonest location is in the uterine corpus^[3,6,7]; however, the cervix^[2,3,8,9], broad ligament, retroperitoneum and ovary can also be involved.^[10] It can be intramural, subserosal or submucosal.^[3,11] In our study, nine tumors were in

the uterine corpus, and intramural while one of them was in the cervix. Its size ranged from 1 to 15 cm in diameter in the study, though giant lipoleiomyomas have been reported in the literature.^[8,9]

The pathogenesis of a lipoleiomyoma is controversial and IHC studies have played an integral role in explaining its complex histogenesis. The origin of the lipomatous lesions of the uterus have various proposed theories that include misplaced embryonic fat cells, metaplasia of muscle or connective tissue cells into fat cells, lipocytic differentiation of a specific primitive connective tissue cell, perivascular fat cells accompanying the blood vessels into the uterine wall during surgery, or fatty infiltration or degeneration of connective tissue.^[12] Another study also suggested that this tumor might arise from multipotential undifferentiated mesenchymal cells^[13] or from direct transformation of smooth muscle cells into adipocytes.^[11] In our study, the smooth muscle cells intervening the adipose tissue were positive for SMA, desmin, vimentin, while the adipose tissue was positive for vimentin, thus supporting the theory of direct transformation of muscle cells into adipose cells that may originate from the transformation of a totipotent mesenchymal cell. Terada T showed in their study the presence of ER and PR in the adipose tissue component, and suggested that the adipose element is specific fat tissue related to the female genital organs.^[9] Some authors also showed focal proliferation of adipocytes, labelled by Ki-67 staining, and further suggested that the adipocyte component is neoplastic rather than degenerative.^[7,8] But, in our study the adipose tissue component in all the cases were negative for ER, PR, Ki-67. Thus, contraindicating these presumptions.

Cytogenetic studies of uterine lipoleiomyoma have also been performed by many authors, who have suggested that uterine lipoleiomyoma has a pathogenic origin similar to that of a typical leiomyoma.^[14] Many researchers have also regarded hyperestrogenic state contributing to its development.^[2,9,10,12] These include various metabolic disorders such as hyperlipidemia, hypothyroidism and diabetes mellitus, postmenopausal lipid metabolism changes, toxemia during pregnancy.^[15] The relationship between gynecologic malignancies, which may originate from the uterus, cervix, or ovaries, and coexistent lipoleiomyoma has also been reported

in few studies.^[3,6,12] In these patients, a concomitant gynecological malignancy and estrogen-related lesions appeared to be common, presumably related to estrogenic stimulation in these patients. This observation suggests that finding adipocytes in an otherwise normal leiomyoma should lead to further detailed clinical and pathological evaluation to search for the presence of a coexistent gynecological malignancy, estrogenic status or metabolic disorders. In the present study, two patients were diabetic, two had hypothyroidism while one had high triglyceride levels. Four patients with gynaecological malignancies (endometrial carcinoma (2), ovarian teratoma, ovarian serous carcinoma) had lipoleiomyoma whereas one case operated of cervical malignancy turned out to be a case of cervical lipoleiomyoma histopathologically.

It is usually detected as a chance histopathological finding postoperatively but for its diagnosis imaging can play an important role in determining its location and fatty nature. On ultrasonography (USG), the lesion is echogenic and is usually partially encased by a hypoechoic rim. The hypoechoic rim is thought to represent a layer of myometrium surrounding the fatty component. However, USG findings are not specific for its diagnosis.^[3,16] Magnetic resonance imaging (MRI) or computed tomography (CT) can exclusively show the fat content within the tumor.^[17] Therefore, in combination with sonography, CT and MRI may assist in the preoperative diagnosis of lipoleiomyomas.^[18,19] However, histopathological evaluation is necessary for its definitive diagnosis and differential diagnosis.^[18,20] In the present study, radiology was confirmatory about lipoleiomyoma in only two patients and in rest of the cases, it was not helpful.

Its differential diagnosis include spindle cell lipoma, angiolipoma, angiomyolipoma, atypical lipoma, myelolipoma, myxoid mesenchymal tumors, pelvic fibromatosis, well-differentiated liposarcoma, carcinosarcoma with heterologous liposarcomatous differentiation, benign cystic ovarian teratoma and other ovarian fatty tumors (lipomas), and benign or malignant degeneration of ordinary leiomyomas.^[3,7]

Lipoleiomyoma, if asymptomatic, require no treatment and is clinically similar to a leiomyoma, so it is essential to distinguish this tumor from other tumors that need surgical excision like benign cystic ovarian teratomas.^[3,7] It is considered to be benign but a

close follow-up is necessary, as lipoleiomyosarcomas arising in uterine lipoleiomyomas and intravenous lipoleiomyomatosis, a potentially life-threatening condition have also been reported in the literature. [21,22]

Conclusion

Uterine lipoleiomyoma is a benign fatty tumor representing lipomatous differentiation rather than a degenerative or neoplastic change in uterine leiomyomas. It is mainly associated with hyperestrogenic conditions and histopathology along with IHC studies is necessary for its diagnosis and for understanding its complex histogenesis.

Funding Source

Nil

Conflict of Interest

No

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